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1944

THE PAN-PACIFIC ENTOMOLOGIST

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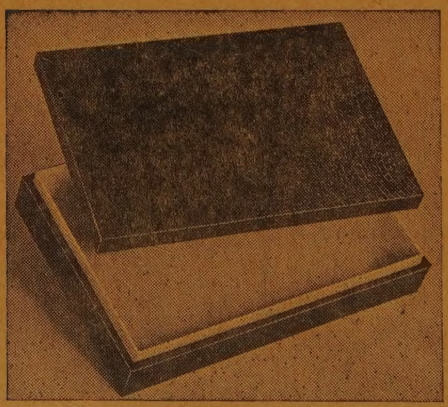

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A REVIEW OF D. L. CRAWFORD'S SPECIES OF THYSANOPTERA

BY STANLEY F. BAILEY
University of California, Davis

As a part of a study of California thrips it has been necessary to carefully review all the previous work done in order to accurately identify valid species and to avoid creating additional synonymy when describing new forms. In former papers the writer has reviewed other published works on western Thysanoptera. The present report covers the species described by D. L. Crawford[1].

The two genera, the sixteen species, and five varieties described by Crawford are listed below in the order they appeared and under the names assigned them. *Ankothrips* n. gen., *A. robustus*, *Aeolothrips longiceps*, *Euthrips minutus* var. *setosus*, *Phyllothrips fasciculata*, *P. fasciculata* var. *stenoceps*, *Aeolothrips vespiformis*, *Heterothrips decacornis*, *Chirothrips mexicana*, *Euthrips insularis* var. *reticulata*, *Rhaptothrips* n. gen., *R. peculiaris*, *Anaphothrips longipennis*, *Euthrips cephalicus*, *E. cephalicus* var. *reticulata*, *Dictyothrips reticulata*, *Thrips abdominalis*, *Phloeothrips raptor*, *Liothrips umbripennis mexicana*, *Liothrips bakeri*, *Liothrips mcconnelli*, *Anthrothrips variablis*, *Idolothrips angusticeps*.

Hood has studied types and cotypes and reported (*in litt.*) upon the following species: *Phyllothrips fasciculatus*, *P. fasciculatus* var. *stenoceps*, *Chirothrips mexicanus*, *Euthrips insularis* var. *reticulata*, *E. cephalicus*, *E. cephalicus* var. *reticulata*, *Liothrips bakeri*, *L. mcconnelli* and *Anthothrips variabilis*. The synonymy of these species is briefly given below:

[1] Crawford, D. L., 1909, Some new Thysanoptera from Southern California, Pomona Coll. Jour. Ent., 1(4):100-108; Some Thysanoptera of Mexico and the South, ibid., 1(4):109-119; Notes on California Thysanoptera, ibid., 1(4):120-121, 1910, Thysanoptera of Southern California, ibid., 2(1):149-152; Thysanoptera of Mexico and the South, ibid., 2(1):153-170.

HAPLOTHRIPS FASCICULATUS (D. L. CRAWFORD)

1909. *Phyllothrips fasciculata* D. L. Crawford, Pomona Coll. Jour. Ent. 1(4):105-108, fig. 48, A-H.
1909. *Phyllothrips fasciculata* var. *stenoceps, idem*, p. 108.

The complete synonymy has been given by Hood (Pan-Pac. Ent. 3:174-175, 1927) and by Bailey (Pan-Pac. Ent. 13:90, 1937).

CHIROTHRIPS MEXICANUS D. L. CRAWFORD

1907. *Chirothrips crassus* Hooker (nec Hinds), U.S.D.A. Bur. Ent., Bull. 65:13.
1909. *Chirothrips mexicana* D. L. Crawford, Pomona Coll. Jour. Ent., 1:114-115, fig. 51, A-H.
1920. *Chirothrips floridensis* Watson, Fla. Ent. 4(2):21-22.
1923. *Chirothrips floridensis* var. *catchingsi* Watson, Fla. Agr. Exp. Sta. Bull. 168-76.
1927. *Chirothrips mexicanus*, Hood, Ent. News 38:112.
1928. *Chirothrips mexicanus*, Moulton, Proc. Haw. Ent. Soc. 7: 106-107.
1939. *Chirothrips mexicanus*, Andre, Proc. Ent. Soc. Wash. 41(6): 197.
1939. *Chirothrips mexicanus*, Hood, Rev. de Entom. 10(2):464-466 (Brazil).

FRANKLINIELLA INSULARIS (FRANKLIN)

1908. *Euthrips insularis* Franklin, Proc. U. S. Nat. Mus. 33:715, Pl. 63, figs. 1, 2, 3, 5, 6, 7, and Pl. 65, figs. 19, 24.
1909. *Euthrips insularis* var. *reticulata* D. L. Crawford, Pomona Coll. Jour. Ent. 1:116.
1914. *Frankliniella insularis*, Hood, Proc. Ent. Soc. Wash. 16:38.

FRANKLINIELLA CEPHALICA (D. L. CRAWFORD)

1910. *Euthrips cephalicus* D. L. Crawford, Pomona Coll. Jour. Ent. 2:153-155, fig. 63, A-H.
1910. *Euthrips cephalicus* var. *reticulata* D. L. Crawford, Pomona Coll. Jour. Ent., 2:155.
1913. *Euthrips tritici* var. *bispinosus* Morgan, Proc. U. S. Nat. Mus., 46(2008):10-11, figs. 17-18.
1914. *Frankliniella cephalica*, Hood, Proc. Ent. Soc., Wash., 16: 38, 42.
1915. *Euthrips tritici* var. *projectus* Watson, Ent. News 26:51-52.
1919. *Frankliniella bispinosus* Watson, Fla. Buggist 3(1):4-7.
1923. *Frankliniella tritici bispinosa*, Watson, Fla. Ent. 7(1):9-11.
1923. *Frankliniella tritici bispinosa*, Watson, Fla. Agr. Exp. Sta. Bull. 168:39.
1925. *Frankliniella cephalica*, Hood, Bull. Brooklyn Ent. Soc. 20: 72-73.

GYNAIKOTHRIPS UZELI (ZIMMERMAN)

1900. *Mesothrips uzeli* Zimmerman, Bull. Inst. Bot. Buitenzorg, 7:12, fig. 4, i-iv, fig. 5, i, ii.
1908. *Phlaeothrips ficorum* Marchal, Bull. Soc. Ent. France, 14: 252.
1910. *Liothrips bakeri* D. L. Crawford, Pomona Coll. Jour. Ent., 2(1):161-163, fig. 67, A-D.
1913. *Gynaikothrips uzeli*, Hood, Ins. Ins. Mens. 1(12):153-154, Complete synonymy.

LEPTOTHRIPS MALI (FITCH)

1855. *Phlaeothrips mali* Fitch, Trans. N. Y. State Agr. Soc. 14: 806-808.
1902. *Cryptothrips aspersus* Hinds, Proc. U. S. Nat. Mus. 26:205-206, 209.
1904. *Criptothrips californicus* Daniel, Ent. News. 15:293-294.
1908. *Phyllothrips aspersus*, Hood, Canad. Ent. 40:305.
1909. *Leptothrips aspersus*, Hood, Ent. News 20:249-250.
1910. *Liothrips mcconnelli* D. L. Crawford, Pomona Coll. Jour. Ent. 2:163-166, fig. 68, A-G.

The complete synonymy is given by the writer (Bailey, 1940, Jour. Econ. Ent. 33(3):543.

HAPLOTHRIPS GOWDEYI (FRANKLIN)

1908. *Anthothrips gowdeyi* Franklin, Proc. U. S. Nat. Mus. 33(1590):724-725, figs. 8, 15, 16, 23.
1910. *Anthothrips variabilis* D. L. Crawford, Pomona Coll. Jour. Ent. 2:166-167, fig. 69, A-E.
1912. *Haplothrips gowdeyi*, Hood, Proc. Biol. Soc. Wash. 25:62.

Additional synonymy has been given by Hood (1918-21, Mem. Queensland Mus. 6-7:121-130) and Moulton (1933, Rev. de Ent. 3(3):389, Brazil).

The writer has previously studied the types of *Ankothrips robustus* D. L. Crawford, 1909 (Bailey, 1940 Pan-Pac. Ent. 16(3):97-106) and *Thrips abdominalis* D. L. Crawford, 1910 (Bailey, 1937, Canad. Ent. 69:121-126). The synonymy of valid species has been completely reviewed in the foregoing references. Crawford himself (1941, Pomona Coll. Jour. Ent. 2:149) sank the variety *setosus* of *Frankliniella minuta*, Moulton), 1907. *Rhaptothrips peculiaris* D. L. Crawford (Pomona Coll. Jour. Ent. 1:116-119, fig. 52, A-H) was early recognized as invalid by Bagnall (1910, Ann. Ent. Soc. Belg. 54:462) since the description was

founded on a larval form (see also Hood, 1912, Proc. Biol. Soc. Wash. 25:61) *Aeolothrips vespiformis* D. L. Crawford (Pomona Coll. Jour. Ent. 1:109-110, fig. 49, A-D) was placed in *Franklinothrips* by Back (1912, Ent. News 23:73-77) and stands as the type of this distinct genus (see also Hood, 1915, Ent. News 26:162-164).

The remaining species, *Aeolothrips longiceps, Heterothrips decacornis, Anaphothrips longipennis, Dictyothrips reticulatus, Hoplandrothrips raptor, Liothrips mexicana,* and *Dicaiothrips angusticeps,* have not to the writer's knowledge been previously studied and reported upon. Through the kindness of the Dominion of Canada, Department of Agriculture at Ottawa these types have been studied, illustrated, and redescribed as deemed necessary to their clarification.

Aeolothrips kuwanaii (Moulton)

1907. *Aeolothrips kuwanaii* Moulton, U. S. D. A., Bur. Ent., Tech. Ser. 12(3):47-48, Pl. 1, figs. 5-8.
1909. *Aeolothrips longiceps* D. L. Crawford, Pomona Coll. Jour. Ent. 1:101-103, fig. 46, A-G. New synonymy.
1913. *Franklinothrips longiceps,* Bagnall. 2nd. Int. Congr. Ent. (Oxford, 1912), p. 397.
1913. *Franklinothrips longiceps,* Bagnall. Jour. Ec. Biol. 8:157-158.
1915. *Aeolothrips kuwanaii,* Hood, Ent. News 26:162.
1935. *Aeolothrips longiceps,* Bailey, Pan-Pac. Ent. 11(4):163.

The male holotype when studied with carefully controlled transmitted light exhibits the tracings of cross veins in the fore wings. It has all the characteristics of *Aeolothrips kuwanaii* and is definitely synonymous with Moulton's species.

Heterothrips decacornis D. L. Crawford

1909. *Heterothrips decacorni* D. L. Crawford, Pomona Coll. Jour. Ent. 1:110-114, fig. 50, A-I.

This species, represented on the type slide by two females, is distinct from all other species in this genus in that it has the scales on the posterior margin of the dorsum of the abdominal segments fused together (see fig. 4).

The head and pronotum (fig. 7), and the third antennal segment (fig. 5) also have been illustrated from the dorsally mounted specimen for further separation from other species. The writer has not seen *pectinifer* Hood or *mexicanus* Watson

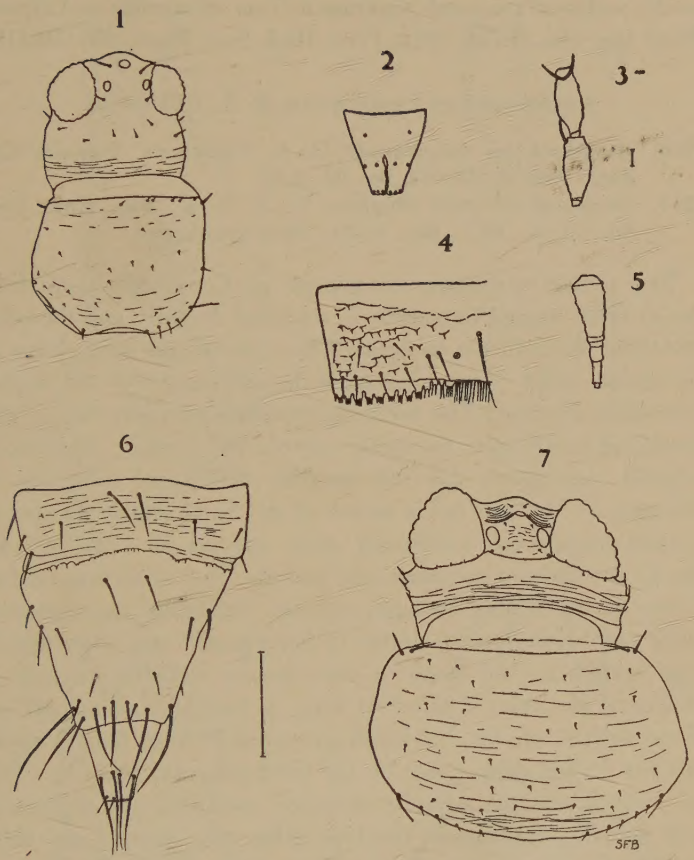

PLATE I

Fig. 1. Head and pronotum of *Anaphothrips longipennis* D. L. Crawford. 2. Dorsum of last abdominal segment of *Ctenothrips reticulatus* (D. L. Crawford). 3. Antennal segments III and IV of left antenna of *Anaphothrips longipennis*. 4. Left half of dorsum of abdominal segment VI of *Heterothrips decacornis* D. L. Crawford. 5. Antennal segment III of *H. decacornis*. 6. Terminal abdominal segments of *Anaphothrips longipennis*. 7. Head and pronotum of *H. decacornis*.

Scale: Figure 3, 0.01 mm.; figure 6, 0.1 mm. Remaining figures at same magnification as figure 6.

which are apparently the closest relatives of *decacornis* but, based on published descriptions, the very short terminal bristles on the scales of the comb separate it from *mexicanus* and *lyoniae* Hood (see also Hood, 1916, Proc. Biol. Soc. Wash. 29:110-113).

Anaphothrips longipennis D. L. Crawford

1910. *Anaphothrips longipennis* D. L. Crawford, Pomona Coll. Jour. Ent. 2:150-152, fig. 62, A-D.
1911. *Anaphothrips zeae* Moulton, U. S. D. A., Bur. Ent., Tech. Ser. 21:41, Pl. 5, figs. 31-34. New synonymy.

Two female specimens are present on Crawford's type slide; one severely treated in caustic, is mounted dorsally and the other ventrally. As is shown in figure 6 the cleared specimen shows an incomplete comb on the posterior dorsal margin of the eigthth abdominal segment. The ventrally mounted specimen has a fully developed comb as is the usual case in the species. Crawford's original description did not mention this comb nor did he illustrate it. Moulton in his review of the North American species omitted *longipennis* (although other species of Crawford are listed) and did not compare *zeae* with it. The writer has studied a long series of this common species (including macropterous males and brachypterous forms of both sexes) and notes that in some specimens the comb is very sparse and the number of bristles of the vein of the fore wing is variable (as are all the minor bristles on the head and pronotum). One female specimen has forked sense cones on the third antennal segment! Figure 1 illustrates the dorsally mounted specimen of *longipennis* as it actually appears on the type slide and figure 3 the third and fourth antennal segments. There is no doubt that the two species are synonymous when normal variation is considered.

Ctenothrips reticulatus (D. L. Crawford)

1910. *Dictyothrips reticulata* D. L. Crawford, Pomona Coll. Jour. Ent. 2:155-157, fig. 64, A-D.
1911. *Dictothrips reticulatus*, Moulton, U. S. D. A., Bur. Ent., Tech. Ser. 21:24.
1923. *Ctenothrips reticulatus*, Watson, Fla. Agr. Exp. Sta. Bull. 168:36.

This species is represented by the holotype female (which is accompanied by several specimens of *Frankliniella cephalica* on the same slide). The lack of reticulation on the last abdominal

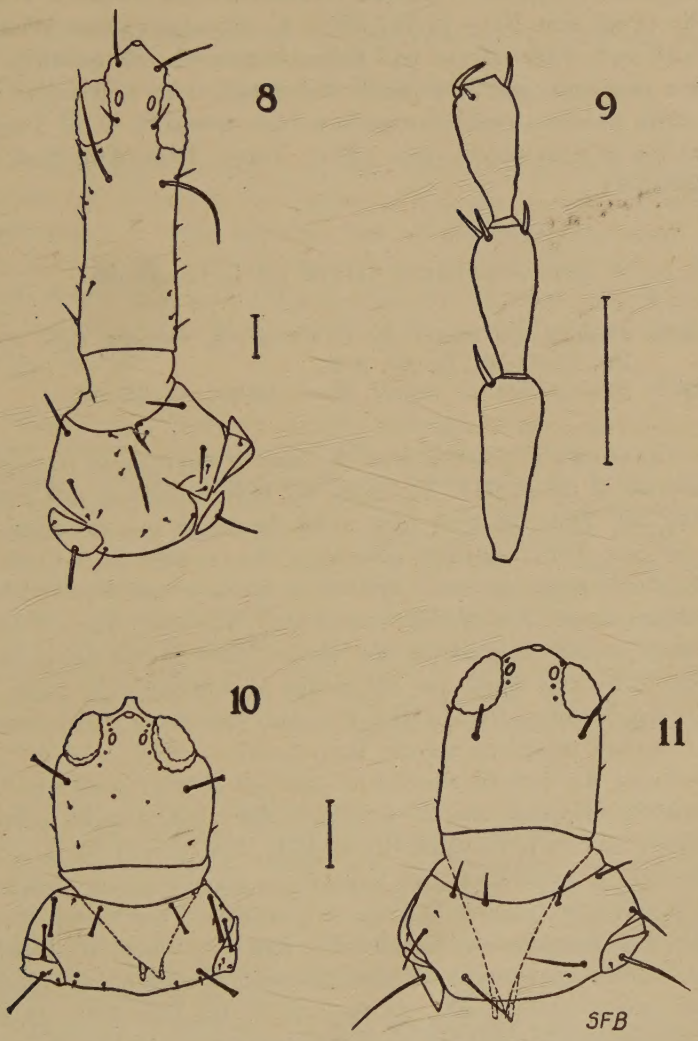

PLATE II

Fig. 8. Head and pronotum of male of *Elaphrothrips angusticeps* D. L. Crawford. 9. Antennal segments III, IV, and V of left antenna of *Liothrips mexicanus* D. L. Crawford. 10. Head and pronotum of *Hoplandrothrips raptor* D. L. Crawford. 11. Head and pronotum of *L. mexicanus*.

Scale: Length of lines at right of figures equals 0.1 mm. Figure 11 is at same magnification as figure 10.

segment (see fig. 2) separates *reticulatus* from *bridwelli* Franklin (1907, Ent. News 18:247-250). *C. reticulatus* shows affinities with both *Taeniothrips* and *Odontothrips;* the reticulations on the pronotum and particularly the dorsal ridge anterior to the ocelli, however, readily separate it from group II, D. of Taeniothrips in Steinweden's key. (1933, Trans. Amer. Ent. Soc. 59: 269-293).

Hoplandrothrips raptor (D. L. Crawford)

1910. *Phloeothrips raptor* D. L. Crawford, Pomona Coll. Jour. Ent. 2:159-161, fig. 66, A-E.
1915. *Hoplandrothrips raptor,* Hood, Entom. 48:102-107.

Crawford's illustration is of the head of the male of *H. raptor* and not of the female. The latter sex is illustrated in this paper (fig. 10) from the type slide which has on it one specimen of each sex, both ventrally mounted. The species in the genus *Hoplandrothrips* are most difficult to separate and Hood (1927, Entom. Amer. 7(n.s.):230) states that "for some years I have busied myself in studying the species alive in the laboratory, and in rearing them; but the results accomplished lie more in the number of slides available for study than in any definiteness of concept regarding specific limitation."

From the limited number of species of this group in the writer's collection, and the published descriptions of the others, *raptor* appears to be valid (Hood, 1941, Rev. de Ent. 12(3):556, Brazil). It seems desirable, however, to supplement the original description as follows: The eyes are prolonged much more dorsally than ventrally (see fig. 10). The number of auxiliary bristles on the posterior margin of the fore wing is nine on the female and twelve on the male. At the base of the fore wing, on the anterior margin there are three strong bristles, all dilated at the tip on the female and on the male only the inner two dilated. As in most thrips of this group, the second antennal segment is darker than the first. The sense cone formula is as follows: III, 1+2; IV, 2+; V, 1+1; VI, 1+1 (+1?). Faint reticulation can be seen in the center of the lateral margins of abdominal segments one to six. The measurement of the principal bristles on the female are (in mm.) po, 0.0561; on the pronotum aa, 0.0594, nl, 0.0561, pa, 0.0726.

LIOTHRIPS MEXICANUS D. L. CRAWFORD

1910. *Liothrips umbripennis* var. *mexicana* D. L. Crawford, Pomona Coll. Jour. Ent. 2:161.

1918–21. *Liothrips mexicanus*, Hood, Mem. Queensland Mus. 6-7: 132.

Hood raised *mexicanus* to specific rank in the above reference but did not expand its description or give any comparison with *umbripennis* or other species. Since Crawford devoted only a few lines to the original description (without illustration) it seems desirable to more fully describe and illustrate (figs. 9 and 11) *mexicanus* from the holotype female (ventrally mounted and partly cleared).

Female (macropterous). Length 2.288 mm. Color uniform dark brown. Antennal segments I and II concolorous with the body, III and basal half of IV clear yellow, remaining segments brown. All legs and tarsi brown.. Wings brown in the basal half becoming gradually lighter toward the tip, marginal bristles light brown.

Head about 0.247 mm. in length and 0.221 mm. in width behind the eyes. Mouth cone long and pointed extending beyond the prosternum. Cheeks nearly straight and faintly notched at margin. Dorsum of head with fine lateral striations near the posterior. Three ocelli present and compound eyes extending posteriorly somewhat more on ventral side than on dorsum. One postocular bristle, blunt at the tip. Sense cones on antennae as follows: III, 0+1; IV, 1+2; V, 1+1 (+1).

Pronotum 0.104 mm. in length at center and 0.312 mm. in width at posterior angles; anastomosing lateral striations present on posterior. Four bristles on anterior margin, one mid-lateral, one at each posterior-lateral angle, and two somewhat forward of posterior margin. All bristles blunt at the tips. Fore femora enlarged and an appressed claw present on fore tarsus. Three strong, blunt bristles equal in length present on anterior margin of fore wing near its base. Fourteen interlocated or auxiliary bristles on posterior margin of fore wing.

Measurements (in mm.): Length of abdomen, 1.417 (including tube); length of tube, 0.195; postocular bristle, 0.079; midlateral bristles, 0.062; posterior-angular bristles, 0.112; antennal segment I, 0.049; II, 0.066; III, 0.095; IV, 0.089; V, 0.085; VI, 0.072; VII, 0.066; VIII, 0.033; total length, 0.557.

This expanded description is based on the type, slide No. 376, of the Canadian National Museum collected at Guadalajara, Mexico, by D. L. Crawford.

Because of the size of the genus *Liothrips* and the difficulty of

determining species from some of the too brief, older descriptions (often inadequately illustrated), the writer is at present unable to give any synonymy for *L. mexicanus*. Moulton's *dumosa* (also from Oak) appears closely related but this species likewise has never been clarified.

Elaphrothrips angusticeps (D. L. Crawford)

1910. *Idolothrips angusticeps* D. L. Crawford, Pomona Coll. Jour. Ent. 2:168-170, fig. 70, A-G.
1912. *Idolothrips angusticeps*, Hood, Proc. Biol. Soc. Wash. 25:62.
1923. *Dicaiothrips angusticeps*, Watson, Fla. Agr. Exp. Sta. Bull. 168:72.
1929. *Elaphrothrips angusticeps*, Moulton, Pan-Pac. Ent. 6(1):12.

This species has all the characteristics of the genus *Elaphrothrips* Andre (1940, Proc. Ent. Soc. Wash. 42(4):75-76) and is apparently distinct (based on the descriptions) from the three other Mexican species in this group: *albospinosus* Moulton and *tener* Pr. are much smaller in size; *dampfi* Hood has much shorter interocular and postocular bristles; Crawford, however, did not state upon which sex his measurements were based.

The type slide has mounted upon it two females and one male, all of which are badly broken up. The most intact specimen (male) has been illustrated in fig. 8 as it actually appears. Crawford based his description on fifteen females and seventeen males from Belize, Havana, Cuba, San Marcos and Chinandega, Nicaragua, and Guadalajara, Mexico. Not all of this material has been available for study and it is quite possible that other species are among them. A detailed study of a series of the Central American species of this group should readily establish the validity of *angusticeps*.

Of the two genera described by D. L. Crawford, *Ankothrips* is a well-established, valid genus. Of the twenty-one species and varieties described by him twelve are, as far as can be ascertained at present, valid. It is hoped that the new illustrations and expanded descriptions of those species in the more difficult genera will enable other workers to more accurately place these and other related North American forms. With the exception of the type of *Chirothrips mexicanus* (Hood, 1927, Ent. News 38: 122; 1939, Rev. de Ent. 10(2):464-466 Brazil), all of D. L. Crawford's type material is at present deposited at Ottawa, Canada.

UNDESCRIBED SPECIES OF TIPULIDAE FROM THE WESTERN UNITED STATES
(Diptera)

PART I

BY CHARLES P. ALEXANDER
Massachusetts State College, Amherst, Mass.

The novelties discussed herewith are from Oregon and Washington, the former having been taken chiefly by Professor James A. Macnab, of Linfield College, McMinnville, Oregon, and by students of Professor Scullen and Mr. Post, of the Oregon State College. The Washington specimens were generously given to me by the collector, Mr. B. Brookman. Where not indicated to the contrary, the types are preserved in my collection of World Tipulidae.

Limonia (Dicranomyia) illustris Alexander, new species

General coloration buffy yellow, the praescutum without distinct darker stripes; rostrum light yellow; antennae with scape obscure yellow, the remaining segments brown; posterior sclerites of notum darkened, more or less pruinose; halteres with stem whitened, knob dark brown; legs long and slender, yellow, the terminal tarsal segments black; wings light yellow, the oval stigma dark brown, very conspicuous; *Rs* a little less than twice the basal section of R_{4+5}; abdominal tergites brown, paling to yellow on sides.

Female. Length about 8 mm.; wing 8.8 mm.

Rostrum light yellow, nearly one-half the remainder of head; palpi with basal segment yellow, the remainder dark brown. Antennae with scape obscure yellow, remainder brown; flagellar segments oval, rather strongly constricted at the sutures; verticils shorter than the segments; terminal segment pointed, only a trifle longer than the penultimate. Head with front and anterior vertex yellow; posterior vertex darkened and heavily pruinose; anterior vertex (female) nearly three times the diameter of scape.

Pronotum brownish yellow. Mesonotum brownish yellow, the central portion of praescutum weakly darkened but not forming distinct stripes; posterior sclerites of notum similarly darkened. Pleura chiefly buffy, the posterior sclerites, and the pleurotergite more pruinose. Halteres with stem whitened, the knob abruptly dark brown. Legs with coxae and trochanters yellow; remainder of legs long and slender, yellow, the terminal tarsal segments passing into black. Wings strongly tinged with light yellow, the prearcular and costal fields clearer yellow; a large and very con-

spicuous, oval, dark brown stigma; veins brown, more yellowish toward the wing base and in costal field. Venation: *Sc* moderately long, Sc_1 ending shortly beyond origin of *Rs*, Sc_2 opposite origin of *Rs*, the latter a little less than twice as long as basal section of R_{1+5}; free tip of Sc_2 and R_2 in transverse alignment; cell *1st* M_2 about as long as vein M_3 beyond it; *m-cu* long, gently sinuous, at or just beyond the fork of *M*; anal veins nearly parallel at their origins.

Abdominal tergites brown, paling to yellow on sides; sternites fulvus yellow. Ovipositor with genital shield yellow; valves deep reddish horn color; cerci slender, rather strongly upcurved to the acute tips; hypovalvae with a black spot at base.

Habitat. OREGON (YAMHILL COUNTY).

Holotype, ♀, CARLTON, Meadow Lake Road, June 5, 1942 (Fender); Alexander collection, through Professor Macnab.

By Doane's key to the Nearctic species of the subgenus (Ent. News, 19:5-7; 1908), this fly runs to *Limonia* (*Dicranomyia*) *citrina* (Doane), an entirely different species. In its general appearance, especially the conspicuous wing stigma, the fly is more like *L.* (*D.*) *ctenopyga* Alexander or *L.* (*D.*) *melleicauda* (Alexander), but is quite distinct. Both of these latter forms have the male hypopygium unusually complex and it is possible that the male of the present fly will show a comparable condition. Besides the type, three further females from the same date and place were sent by Professor Macnab. These differ sufficiently from the type to make me unwilling to consider them as being conspecific, while at the same time agreeing in most details. In these specimens, three praescutal stripes are more or less developed and vein Sc_1 is definitely longer.

Oxydiscus (Oxydiscus) pacificus Alexander, new species

Size large (wing, male, over 5 mm.); general coloration of thorax yellow, virtually unpatterned; antennae dark brown throughout; tibiae spurred; wings subhyaline, the stigmal area vaguely darkened; relatively abundant macrotrichia in outer cells of wing; cell M_1 present; male hypopygium with the basistyle produced beyond the point of insertion of the dististyles as a long, obtusely-pointed lobe that is provided with unusually strong black setae; blades of gonapophyses relatively narrow; spines of ventral fork of aedeagus relatively short and straight, exceeding the short straight aedeagus.

Male. Length about 4.5 mm.; wing 5.4 mm.

Rostrum light brown; palpi darker. Antennae dark brown throughout, 16-segmented; basal three flagellar segments enlarged,

the second and third more or less fused, possibly indicating the beginnings of a fusion segment; succeeding segments passing through oval to elongate-oval, with verticils that much exceed the segments. Head dark brown; anterior vertex about three times the diameter of scape.

Thorax almost uniform polished yellow, the central portion of praescutum a trifle more darkened but not forming an evident stripe. Halteres elongate, yellow, the knobs darkened. Legs with the coxae and trochanters pale yellow; remainder of legs brownish yellow, the terminal tarsal segments blackened; tibial spurs of middle and hind legs long and distinct (fore legs broken); claws simple. Wings whitish subhyaline, the stigmal area vaguely darkened; veins obscure yellow; trichia dark. Macrotrichia of outer cells relatively abundant, from cells R_2 to *Cu*, inclusive. Venation: Sc_1 ending just before level of fork of *Rs*, Sc_2 about one-third as long as Sc_1; *Rs* long; R_{2+3+4} about two and one-half times the basal section of R_5; R_2 faint, apparently placed a little more than its own length beyond fork of R_{2+3+4}; cell M_1 present, about one-third its petiole; *m-cu* beyond mid-length of cell *1st* M_2.

Abdomen dark brown, the posterior borders of the more proximal sternites paler; hypopygium yellow. Male hypopygium with the basistyle produced beyond point of insertion of the dististyles as a strong, stout lobe, much longer and stouter than in *americanus*, obtuse at apex, provided with unusually strong and powerful blackened setae. Outer dististyle unusually slender, at apex with a major axial spine, with a smaller subapical outer spine and a series of microscopic denticles on inner or lower margin before apex. Inner dististyle very obtuse at apex. Gonapophyses appearing as relatively narrow, subcultriform blades, narrower than in *americanus*. Ventral fork of aedeagus with the spine widely separated at base, nearly straight, simple and unusually short. Aedeagus shorter and stouter than either spine, in *americanus* longer than the spine and gently sinuous.

Habitat. OREGON (YAMHILL COUNTY).

Holotype, ♂, CARLTON, Meadow Lake Road, June 5, 1942 (Fender); Alexander Collection, through Professor Macnab.

The present species is the first member of the genus to be discovered in the western Nearctic region. It is most similar to the eastern Nearctic *Oxydiscus* (*Oxydiscus*) *americanus* (Alexander), differing especially in the larger size, body coloration, and, especially, the structure of the male hypopygium, as compared above. All of the known American species show strong hypopygial characters. Besides the four known at present from the eastern Nearctic, a few others are now known from Mexico, southward to Ecuador.

Dactylolabis postiana Alexander, new species

General coloration brownish black, the praescutum yellow pollinose, with four very distinct blackened stripes; halteres yellow; wings pale yellow, with a very heavy brown pattern, the total amount of dark being approximately equal to the pale ground; dark areas in part ocelliform; marginal areas at ends of longitudinal veins, lacking only on veins R_5 and M_1, becoming very large in the cubital and anal fields; a supernumerary crossvein in cell R_3, in transverse alignment with R_2; R_{2+3+4} longer than *m-cu*.

Female. Length about 8 mm.; wing 8 mm.

Rostrum and palpi black, the former sparsely pruinose. Antennae black; flagellar segments oval, the two or three proximal flagellar segments with short pale apical necks; longest verticils a little shorter than the segments. Head dark brown, the front, posterior orbits and genae light gray.

Pronotum brown, with a narrow median blackish line, the posterior border of sclerite more extensively blackened. Mesonotal praescutum yellow pollinose, with four very distinct black stripes, the intermediate pair narrow; scutal lobes extensively blackened; scutellum and postnotum pruinose, the ground color of the former dark brown. Pleura and pleurotergite heavily gray pruinose; dorsopleural membrane brown behind the spiracle, with a yellowish spot immediately ventrad of the latter. Halteres pale yellow. Legs with coxae dark brown, heavily pruinose; trochanters obscure yellow, their apices narrowly ringed with black; femora, tibiae and basitarsi obscure brownish yellow, narrowly blackened at tips; remainder of tarsi black. Wings pale yellow, with a very heavy brown pattern, the total amount of dark being approximately equal to the ground; dark areas in part ocelliform, dark with paler centers, especially those at cord, outer end of cell *1st* M_2 and at wing-margin; dark areas distributed as follows: A series of five or six in cell *C*; major marks at arculus, origin of *Rs*, before outer end of *Rs*, tip of *Sc* and over the fork of R_{2+3+4}, over R_{1+2}, R_2 and over the supernumerary crossvein in cell R_3; major marginal areas at ends of all longitudinal veins excepting R_5 and M_1, from vein M_2 backward becoming progressively larger, the largest of all in the axillary field, including more than the proximal half of cell *2nd A*, extending into cell *1st A*; other areas along cord, outer end of cell *1st* M_2, fork of M_{1+2}, on distal third of vein *M* and along vein *1st A* at near mid-length; veins brownish yellow, darker in the patterned areas. Venation: Sc_1 ending about opposite the fork of R_{2+3+4}, Sc_2 at its tip; R_{2+3+4} relatively long, about one-third longer than *m-cu*; a supernumerary crossvein in cell R_3, in transverse alignment with vein R_2; cell *1st* M_2 moderately long, subequal to vein M_4 beyond it; cell M_1 about one-third longer than its petiole; *m-cu* just beyond the fork of *M*.

Abdominal tergites black, their discal portions slightly paler; genital shield dark castaneous; sternites brownish black, the cen-

tral portions of the intermediate segments broadly obscure yellow. Ovipositor with cerci compressed-flattened, relatively wide, the tips subacute.

Habitat. OREGON (COLUMBIA COUNTY).

Holotype, ♀, VERNONIA, April 1, 1938, on willow (K. Gray and J. Schuh); type in collection of Oregon State College.

I am pleased to name this species for Mr. R. L. Post, to whom I am indebted for numerous favors in the past. This is one of the most distinct species of the genus so far made known. It is readily distinguished from all other Nearctic species by the very heavy dark wing pattern that is in part ocelliform, with pale centers.

Cladura macnabi Alexander, new species

General coloration of thorax yellow, variegated with brown, including a single median praescutal stripe; dorsal mesopleura darkened; fusion-segment of antennae short, about equal in length to the two succeeding segments combined; halteres uniformly yellow; wings whitish subhyaline, vein *Cu* darker; vein R_2 very faintly indicated; cell *1st* M_2 large, about as long as vein M_3 beyond it; cell M_1 deep, about three times its petiole; male hypopygium with a single dististyle, this provided at apex with short blackened pegs; gonapophyses narrowed outwardly, produced into a very delicate, hyaline, spinous point.

Male. Length about 6 mm.; wing 6.8 mm.

Rostrum brown, palpi dark brown. Antennae with scape yellow; remainder of organ dark brown; fusion-segment cylindrical, about as long as the succeeding two segments combined and evidently formed of two such segments; succeeding segments oval to long-oval, with very long verticils. Head above clear gray, paling to brown on the genae and beneath; anterior vertex relatively broad, nearly four times the diameter of scape; eyes with course ommatidia.

Pronotum brown above, paler on sides, provided with a few long conspicuous setae. Mesonotal praescutum yellow, with a single dark brown stripe, this broad and conspicuous, not reaching the suture behind; scutum obscure yellow, each lobe with two brown areas, the more cephalic one larger; scutellum and mediotergite chiefly dark brown; pleurotergite and lateral portions of mediotergite obscure yellow. Pleura yellow, including the dorsopleural membrane; conspicuous brown spots on dorsal anepisternum and dorsal pteropleurite. Halteres relatively long, entirely pale yellow. Legs with the coxae and trochanters yellow; remainder of legs yellow, the tarsi infuscated. Wings whitish subhyaline, virtually unpatterned, variegated only by the more darkened cubital vein and faintly darkened adjoining portions of the membrane; no stigmal darkening; remaining veins chiefly pale,

those beyond cord a trifle darker. Venation: R_2 very faint, at near mid-length of upper branch of *Rs*, R_{2+3} thus slightly less than twice the arcuated R_{2+3+4}; Sc_2 near tip of Sc_1; cell *1st* M_2 large, about as long as vein M_3 beyond it; basal section of M_3 oblique, about twice *m*; cell M_1 deep, about three times its petiole; *m-cu* just beyond fork of *M*; vein *2nd A* short, ending before level of origin of *Rs*.

Abdominal tergites dark brown; basal sternites yellow, the outer segments slightly more infuscated, with paler caudal borders; eighth and ninth segments blackened to form a conspicuous subterminal ring. Male hypopygium with the basistyle relatively slender, at apex produced into a lobe that is about one-fifth as long as the dististyle. Dististyle single, long and gently curved to the blunt tip that is set with short blackened pegs. Gonapophyses appearing as flattened blades, narrowed apically, the tip narrowed into an unusually delicate hyaline spinous point.

Habitat. OREGON (YAMHILL COUNTY).

Holotype, ♂, McMINNVILLE, October 3, 1936, shrub association (Macnab); Collector's No. 18; Alexander Collection, through Professor Macnab.

This distinct species is dedicated to the collector, Professor James A. Macnab, to whom I am much indebted for many interesting species and records of Tipulidae from Oregon. The fly is very different from the other regional members of the genus, especially in the venation and the structure of the male hypopygium. The wing venation is much as in *Pterochionea* Alexander but the fusion-segment of the antennae is short, as in *Cladura*. In the light of this new discovery, it seems possible that *Pterochionea* will best be placed as a subgenus of *Cladura* Osten Sacken.

Gonomyia (Idiocera) brookmani Alexander, new species

Belongs to the *blanda* group; allied to *californica*; rostrum darkened; antennae with scape blackened on lower face, yellow above; sublateral praecsutal stripes present; thoracic pleura conspicuously striped longitudinally with yellowish white on a brownish gray ground; wings patterned with brown, as in the group; R_{1+2} and R_3 very closely approximated to confluent at wing margin; abdomen brownish black, the segments conspicuously ringed caudally with pale yellow; male hypopygium with the outer lobe of basistyle pale throughout, terminating in an acute pale spine; outer and intermediate dististyles blackened, both obtuse at tips.

Male. Length about 5.2 mm.; wing 6 mm.

Female. Length about 5.5 mm.; wing 5.8-6 mm.

Rostrum blackish gray; palpi black. Antennae with scape blackened beneath, yellow above; pedicel and flagellum brownish black to black. Head above obscure yellow, with a restricted dark area on vertex.

Pronotum dark brown above, with an obscure yellow median spot behind, the lateral borders light yellow. Mesonotal praescutum clear gray, with elongate intermediate dark brown stripes, the sublateral pair narrow and poorly indicated; humeral and lateral portions of sclerite light yellow; pseudosutural fovea castaneous; posterior sclerites of notum gray, the scutal lobes with a darkened area on their mesal portion; posterior callosities of scutum yellow; postnotum gray, the dorsal portion of pleurotergite pale whitish yellow, crossing the suture onto the cephalolateral portion of the mediotergite. Pleura dark brown, pruinose, conspicuously patterned with yellowish white, including a conspicuous ventral stripe that expands behind onto the metapleura; dorsopleural area variegated with yellow. Halteres yellow, knobs blackened. Legs with the fore and middle coxae pale yellow, the posterior pair more darkened basally; trochanters obscure yellow; femora obscure yellow, with a nearly terminal dark brown ring; tibiae obscure yellow, the tips narrowly blackened; tarsi passing into black. Wings subhyaline, the prearcular and costal fields somewhat more whitened; a conspicuous brown pattern, arranged as in the group, including marks at *h*, arculus, origin of *Rs*, fork of *Sc*, stigma, cord, fork of M_{1+2} and in outer end of cell R_3; in more heavily patterned specimens, the margin of cell R_4 is darkened; veins brown, yellow in the brightened fields. Venation: *Sc* relatively long, Sc_1 ending about opposite mid-length of *Rs*, Sc_2 near its tip; R_{1+2} and R_3 very closely approximated to confluent at margin; *m-cu* from one to one and one-half times its length before fork of *M*.

Abdomen brownish black, sparsely pruinose, the segments conspicuously ringed caudally with pale yellow. Male hypopygium with the outer lobe of basistyle terminating in a short acute pale point, much shorter than in *californica*. Outer and intermediate dististyles both heavily blackened and blunt at their tips, the latter ones abruptly though slightly dilated at apex; inner style broadly flattened, its tip truncated. Aedeagus relatively narrow, entirely pale, the tip a short recurved point.

Habitat. WASHINGTON (YAKIMA COUNTY).

Holotype, ♂ NACHES, June 5, 1941 (Brookman). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, 1 ♂, 3 ♀♀, with the types.

The species is named for Mr. B. Brookman, to whom I am indebted for many interesting Tipulidae from the Yakima Valley. The nearest relative of the fly is *Gonomyia* (*Idiocera*) *californica* Alexander, of California, which differs most evidently in the structure of the male hypopygium especially the long terminal spine of the outer lobe of the basistyle, and the acutely pointed intermediate dististyle.

A NEW GENUS—PREMANUS—AND SPECIES OF MEXICAN LEAFHOPPER RELATED TO OMANANA

(Homoptera, Cicadellidae)

BY DWIGHT M. DeLONG
Department Zoology and Entomology, Ohio State University

Premanus new genus

Related to *Omanana*. The vertex is short and broad, roundedly produced but appearing parallel margined. The vertex is distinctly depressed just above margin, the margin being emphasized by the depressed line. The first anteapical cell is quite short, the second is long. The male plates are long and tapered at apex as in *Osbornellus*. The aedeagus is simple and not composed of paired structures as in *Omanana*.

Genotype *Premanus hebatus* DeLong.

This genus seems to be somewhat intermediate between *Osbornellus* and *Omanana*, but in general appearance it resembles the latter more closely.

Premanus hebatus DeLong, new species

In general form and appearance resembling *Omanana* but with distinct vertex, color pattern and genitalia. Length 6-7 mm.

Vertex produced, rather broadly rounded, more than twice as wide between eyes at base as median length.

Color pale brown with dark brown markings. The ocelli are white between which in the female is a pale broken line. In the male there are only faint traces of this line. Just above ocelli is a black transverse band interrupted by a pale depressed transverse line. On basal half of vertex there is a round black spot next either eye and a broad longitudinal spot either side of middle. Pronotum irrorate with dark brown. Scutellum pale brown with a white dash surrounded with dark brown in each basal angle, the apex, midway on each side between these, and one either side of middle on anterior margin equidistant from the spots in basal angle and from each other. Elytra smoky, veins dark brown and with a few white areolar spots. Spots along costa and apical margin dark brown. Face black with traces of pale arcs and a white band below ocelli in female.

Genitalia: Female last ventral segment gradually produced from each basal angle to form a rather broad, produced medium tooth at center which is slightly notched at apex. Male plates long

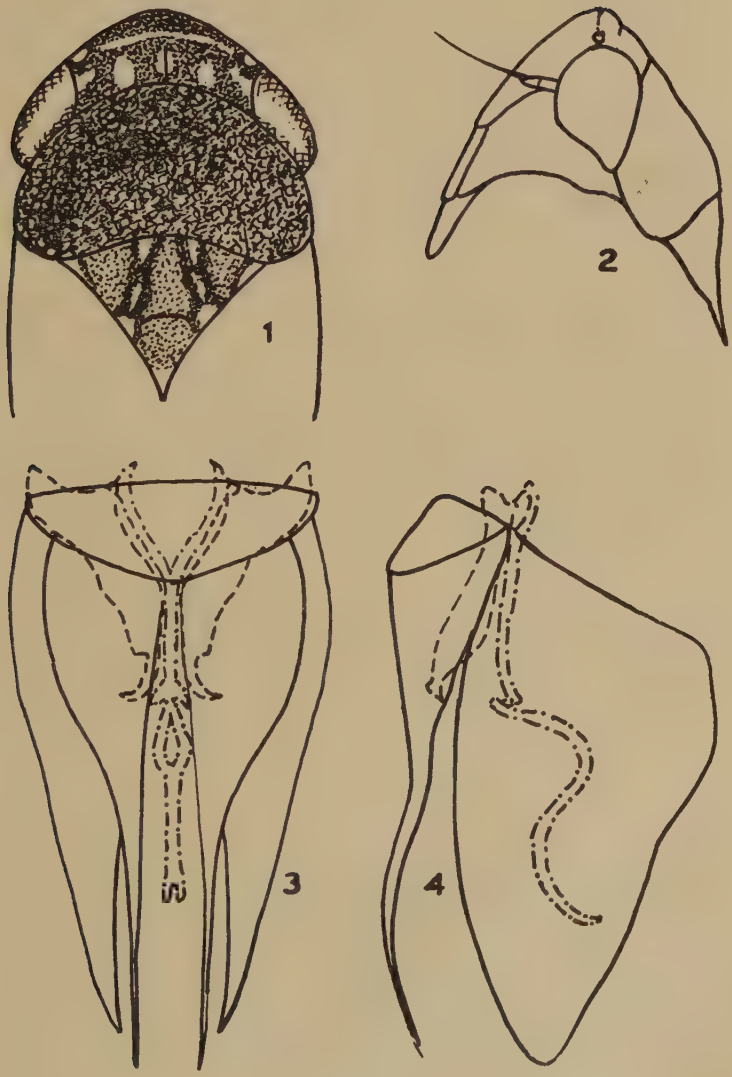

PLATE I

PREMANUS HEBATUS DeLONG

Fig. 1. Dorsal view of head and pronotum. 2. Lateral view of head and pronotum. 3. Ventral view of male genitalia. 4. Lateral view of male genitalia.

with apical half slender and tapered. Style long, apical fifth slender, finger-like, curved outwardly with pointed apex. Aedeagus long, slender, with apex slightly bifid. In lateral view the aedeagus form an S-curve.

Holotype male and *allotype* female collected at TAMAZUNCHALE, S. L. P., November 16, 1938, by J. S. Caldwell.

UNBIDDEN HOUSE GUESTS

Unbidden House Guests. By Hugo Hartnack. Hartnack Publishing Co., Tacoma, Wash. 226+62+112+160 pp., illus., 1943. Price $12.00, plus 20c postage.

This is Volume I of a comprehensive two-volume handbook on household pests. It is written in four parts, the first of which considers the more general features of the biology and ecology of household pests and their control. Part two takes up plants, both as pests themselves like the wood-rotting fungi, and in their relation to animal pests. Parts three and four treat respectively of the invertebrates and the vertebrates, but exclusive of the insects, which are reserved for the second volume. Insects, however, loom very large in this first volume in connection with the introductory section on general principles and in relation with household plants and vertebrates; moreover, 92 pages in the section on invertebrates are devoted to crustaceans, myriapods, and arachnids, which come under the perview of the practical if not of the theoretical entomologist!

Dr. Hartnack's ideal is that of a unified science of the plant and animal ecology of the household. He insists that one's first step should be an understanding of the habitat relationships involved, and that only then is one in a position to effect control measures that are more than palliative and temporary in effect.

Among some of the more unusual topics treated in the book may be mentioned sections on the origin of housepests, the climate of the house, the identification of pests by means of the traces they leave behind them of themselves and their activities, the decay of cadavers, and keratin or hair-eating pests. In addition there are, of course, the extensive materials on life-habits and methods of prevention and control that one expects such a book to provide. Like its predecessor, "202 Common Household Pests," the present work is amply illustrated and indexed and printed on the best enameled paper. This attractive book should be available to all who are interested in or have occasion to advise others on problems related to the flora and fauna of the household. May the reception accorded it warrant its author in completing his second volume!—MELVILLE H. HATCH.

STUDIES ON NORTHWESTERN STAPHYLINIDAE I: ANTHOBIUM STEPH.

BY. MELVILLE H. HATCH
University of Washington, Seattle

This is the first of a series of papers in which I hope to make known some of the apparently undescribed species of Staphylinidae represented in my collection mostly from the State of Washington.

ANTHOBIUM (EUSPHALERUM) CALIFORNICUM FAUVEL

Anthobium (*Eusphalerum*) *californicum* Fauvel, Bull. Soc. Linn. Normand (3) II, 1878, p. 198, 199.

Blewett, Cle Elum, Swauk Creek (Kittitas County). Also a specimen from Golden, Oregon.

ANTHOBIUM (EUSPHALERUM) ORIENTALE BERNHAUER

Anthobium (*Eusphalerum*) *orientale* Bernhauer, Pomona Coll. Jour. Ent. IV, 1912, p. 678.

I identify with this species originally described from New Hampshire and Massachusetts an extensive series from Western Washington. I suspect it is the species identified as *horni* Fauv. by Blatchley, Col. Ind. 1910, p. 481, being distinguished from the true *horni* by its finely punctate pronotum.

Anthobium (Eusphalerum) farrarae Hatch, new species[1]

Color testaceous, except for the eyes and the four basal segments of the abdomen in the male which are black; head, pronotum, and elytra coarsely, evidently, relatively densely punctate, the punctures separated by about their own diameter or less, those on the pronotum somewhat the densest and most clear cut; head and pronotum alutaceous; pronotum about two-thirds as long as wide, the apex about three-fourths as long as the base, the front angles broadly, the hind angles more narrowly rounded, the sides explanate, more strongly so behind, the side margins arcuate or just appreciably oblique before the hind angles, the median line

[1] I propose to name some of the new species in this series of papers after members of the Scarabs Society, an informal semi-social organization composed of some of my former students and others interested in beetles. Since its founding in June, 1937, meetings have been held at the rate of ten or eleven per year. The members are: Elizabeth Farrar Kinney, Barbara Gray Bruhns, Daniel E. Bonnell, Gertrude Minsk, Robert Y. Pratt, Joseph Bruzas, Jr., Clifford J. Burner, Frank M. Beer, Frances Bjorkman, Helen Gellerman Houk, Ervin F. Dailey, Gordon K. Patterson, Robert W. Rogers, Mary Porter Freeman, Warren Ewing, Kenneth M. Fender, Harriet Exline Frizzell.

not grooved; elytra about 2⅓ times as long as the pronotum, covering the three or four basal abdominal segments, the apices in the male arcuo-truncate with the sutural angles narrowly and rectangularly rounded, in the female feebly obliquely truncate with the sutural angles more broadly rounded; the fifth and sixth ventral segments of the abdomen not sexually modified; hind tarsi with the first two segments longer than the third and fourth, the first four longer than the fifth; length 2.7-2.9 mm.

Type and two *paratype* males: FALL CITY, WASH. May 29, 1932, M. H. Hatch. Three additional paratype males from SEATTLE and BOTHELL, WASH. *Allotype* and one *paratype* females: INDEX, WASH. May 25, 1930, M. H. Hatch. Three additional *paratype* females from SEATTLE and "STILLAGUAMISH," near DARRINGTON, WASH.

From allied species, *farrarae* is distinguished by its testaceous color, the first four abdominal segments of the male black, its densely punctate, alutaceous, ungrooved pronotum with arcuate sides, its unmodified sixth male abdominal segment, and its feebly dimorphic elytral apices. It is somewhat related to *pothos* Mann., which is the commonest species in western Washington, in which the pronotum is less densely punctate and grooved along the meridian line, the male with the first four and one half abodminal segments black, the fifth emarginate along its posterior margin, and the elytral apices scarcely at all sexually dimorphic.

Anthobium (Eusphalerum) grayae Hatch, new species

Color testaceous, the median portions of the head and pronotum and the outer portions of the antennae dusky, the meso- and metathorax and abdomen piceous black, the latter slightly paler at the extreme apex in the male; head and pronotum punctate and alutaceous, the latter densely and strongly so, the elytral punctures larger and dense but not so clear cut; pronotum about three-fourths as long as wide, the apex about four-fifths as wide as the base, the front angles broadly rounded, the side margins broadly rounded in front, oblique or subsinuate in front of the narrowly rounded hind angles, the side feebly explanate toward the hind angles, the middle line more or less evidently grooved; elytra about two and one-half times as long as the pronotum, covering four or more abdominal segments; the elytral apices in the male arcuately truncate, the outer angles broadly, the inner angles less broadly arcuate, in the female obliquely truncate, the sutural angles slightly divergent and narrowly arcuate, the apical margin just laterad to the sutural angles feebly sinuate; male with the sixth ventral abdominal segment emarginate along the posterior margin, the seventh ventral consisting of a broad median lobe and

a narrower longer lateral lobe on either side; hind tarsi with the first four segments subequally short, together shorter than the fifth; length 2.1-2.25 mm.

Type male, *allotype* female, and 48 *paratypes*; SEATTLE, WASH., IV-30-1930, M. H. Hatch. 30 additional *paratypes*: SEATTLE, DUVAL, EVANS CR. (King Co.), LONGMIRE (Mt. Rainier), NORTH BEND (Maloney's Grove), all in western WASHINGTON. One *paratype*: OTIS, OREGON.

This species is distinguished from other American species of the subgenus *Eusphalerum* by the slightly sinuate apices of the female elytra. From *farrarae* and *pothos* it is furthermore distinguished by its dusky head and pronotum and black female abdomen.

Anthobium (Anthobium) bonnelli Hatch, new species

Piceous black, the elytra and appendages testaceous; head and pronotum finely distinctly punctate, the pronotum more evidently alutaceous than the head, the elytra more coarsely but less distinctly punctate than the head and pronotum; pronotum about seven-tenths as long as wide, the apex seven-tenths as wide as base, the sides evenly arcuate, the fore and hind angles broadly rounded, the side margin feebly explanate in front of the hind angles; elytra (male) two and one-half or more times as long as the pronotum, covering the three or four basal abdominal segments, the apices broadly arcuate into the more narrowly arcuate sutural angles; elytra (female) more than three times as long as the pronotum, longer than the abdomen, the apices broadly curving into the acutely produced slightly divergent sutural angles, the apical margin just laterad to the sutural angle strongly sinuate; male with fifth abdominal segment unmodified, the sixth abruptly and semi-circularly thickened at the middle, the semi-circular area being separated from the posterior edge by a narrow membranous margin; hind tarsi with the first four segments subequally short, together shorter than the fifth; length 1.8-2.25 mm.

Type male, *allotype* female, and two *paratypes*; SULTAN, WASH. April 14, 1931 M. H. Hatch. Two additional *paratypes* same locality: May 10, 1933, May 13, 1931.

By its dimorphic elytra and the structure of the sixth abdominal segment in the male, this species is related to *tibiale* Csy. from Arizona, from which it differs by its more strongly arcuate pronotal side margins (subparallel, very feebly arcuate in *tibiale*) and longer male elytra (about twice as long as the pronotum in *tibiale*, exposing four abdominal segments, as opposed to only two or three in *bonnelli*).

Anthobium (Anthobium) minskae Hatch, new species

Testaceous, the male with the first four segments of the abdomen black; head and pronotum alutaceous, moderately finely punctate, the pronotum more conspicuously so, elytra with coarser but less clear-cut punctures; pronotum about five-eighths as long as wide, the apex about two-thirds as wide as the base, the median line not grooved, the front angles broadly rounded, the side margins arcuate in front, behind oblique or broadly subsinuate before the more or less obtuse hind angles, the side margins somewhat explanate, more broadly so behind, elytra three (male) or four (female) times as long as the pronotum, the apices (male) broadly rounded into the narrowly rectangularly rounded sutural angles, exposing the apex of the abdomen, or (female) obliquely produced into the narrowly acutely rounded sutural angles, extending beyond the abdomen; male with the posterior margin of the fifth ventral abdominal broadly triangularly incised, the apex of the incision extending as a parallel-sided fissure about four times as long as deep, the length of the fissure being slightly greater than the depth of the triangular incision, the sixth ventral segment broadly triangularly incised along its posterior margin, the median lobe of the seventh segment triangular; male protibiae straight; last tarsal segment shorter than the four basal segments taken together, that of the hind tarsus being about three-fifths as long, the first and second segments elongate; length 2.2-2.7 mm.

Type male, *allotype* and one *paratype* female: OLYMPIC HOT SPRINGS, WASH. May 31, 1931, M. H. Hatch. Ten additional *paratypes*; COOKS, LAKE CRESCENT, LEWIS AND CLARK STATE PARK, SEATTLE, and SWAUK CREEK (Kititas Co.), all in WASHINGTON.

Related to *fraternum* Casey from northern California by the fissure of the posterior margin of the fifth ventral abdominal segment in the male, but distinguished therefrom by the black color of the four basal segments of the male abdomen, which is pale in *fraternum*. Casey makes no mention of the fissure in his species being itself at the apex of a triangular incision, as in *minskae*.

In *farrarae* and *minskae* described above and in such previously described species as *convexum* Fauv. and *fraternum* and *punctatum* of Casey the structure of the tarsi is such as to raise the propriety of retaining them in *Anthobium*. In these species the first two segments of the tarsus are longer than the next two, the first four together longer than the fifth. I leave the problem to future students of the group.

NOTES ON THE HOSTS, HABITS AND DISTRIBUTION OF OREGON ACMAEODERA

(Coleoptera, Buprestidae)

BY FRANK M. BEER
Salem, Oregon

This paper is a record of the *Acmaeodera* of Oregon, mainly collected by the writer during the past seven years. A majority of the species have been taken in the Rogue River Valley where they inhabit their usual hosts which encroach from the Sierra Nevada Range and adjoining foothills. The earlier records for the state are woefully incomplete, the species in reality occurring far more commonly and abundantly than previous reports would indicate. Dr. Chamberlin's[1] paper in 1929 was the last to report this genus and list new material actually taken by an Oregon collector. In his catalogue, Chamberlin[2] lists four species found in Oregon, and an additional one, *flavosticta*, as doubtful, while Barr[3] lists five in his recent excellent resume.

After intensively collecting through the state the number of species has been increased to fourteen and two varieties, and the range of several materially extended. Since a large part of the collecting was done during the winter and early spring by cutting the adults from their pupal cells and a few having been reared from larvae, exact host plants can be given for the majority of the species. Though host plants may not in general be considered to have a great deal of significance, however, after much careful observation, the species have been consistently found inhabiting the same host plant or plants.

ACMAEODERA ACUTA LECONTE

This species is by far the most common collected in southwestern Oregon. It is generally found feeding on the flowers of *Eriophyllum lanatum* (Pursh) Forbes, a yellow composite occurring in the foothills of the Rogue River Valley and southward across the Siskiyou summit into California. The insect also oc-

[1] Chamberlin, W. J., 1929, Remarks of the Buprestidae of the North Pacific Coast Region with descriptions of new species, Pan-Pac. Ent., 5:111.
[2] Chamberlin, W. J., 1926, Catalogue of Buprestidae of North America.
[3] Barr, W. F., 1941, Distribution of Acmeodera, Pan-Pac. Ent., 17:62-69.

curs in the Willamette Valley as occasional specimens have been taken on the blossoms of wild rose (*Rosa pisocarpa* Gary). The larvae mine the smaller dead branches and stems of the Garry oak (*Quercus garryana* Dougl.) from which adult specimens have been cut.

Acmaeodera angelica Fall

Numerous specimens of this little Buprestid have been taken in southwestern Oregon, most of them beaten from the foliage or dug from dead wood scars of buckbrush (*Ceanothus cuneatus* Nutt.), though a few have been cut from dead branches of California black oak (*Quercus californica* [Torr.] Coop.)

The variety *nexa* Fall occurs through the same region and has been taken from buckbrush. Recently a specimen was reared from mountan mahogany (*Cercocarpus betuloides* Hook.).

Acmaeodera bishopiana Fall

The only record we have of this species is of three specimens taken by Mr. M. C. Lane at Adrain, Oregon, on May 28, and reported by Dr. W. J. Chamberlin [4]. It apparently occurs throughout the Great Basin region, as the original specimens came from Owen's Valley, California, and the writer has specimens reared from the Walker Lake region in Nevada. The host in its southern range is the wingscale (*Atriplex canescens* [Pursh] Nutt.). This plant extends northward into Oregon.

Acmaeodera connexa Fall

This species occurs commonly through the southwestern part of the state wherever the host plant is found. Many adult specimens and numerous larvae have been dug from the scars and dead trunks of the Garry oak (*Quercus garryana* Dougl.). During June, it can be taken on one of the willow herbs (*Epilobium* sp.) and occasionally on the composite, *Eriophyllum lanatum* (Pursh) Forbes.

Acmaeodera fenyesi Fall

This uncommon form has not previously been recorded from the state and to my knowledge the host plant has not been reported. The species is apparently quite rare in our range as

[4] Chamberlin, W. J., 1929, Pan-Pac. Ent., 5:111.

literally days of cutting thruogh manzanita (*Arctostaphylos viscida* Parry) has produced only seven specimens. These are somewhat larger than specimens from southern California, and one female is noticeably more maculate. All specimens have been taken from the foothills of the Rogue River Valley.

Acmaeodera gemina Horn

Though this species is never taken in abundance, it is occasionally found feeding on several varieties of flowers or is swept from grass. Careful search over several years has not revealed its host. The species has been taken from the floor of the Rogue River Valley to the high mountains in the vicinity of Crater Lake.

The variety *nebulosa* Horn is apparently rare in this region, as only one specimen has been taken, that from near Crater Lake.

Acmaeodera hepburni LeConte

This is another common species which has a wide range of distribution. It is found throughout the foothills of southwestern Oregon where its larvae infest the Garry oak (*Quercus garryana* Dougl.). It is also taken abundantly on the flowers of the composite *Eriophyllum lanatum* (Pursh) Forbes, along with *acuta, connexa* and *labyrinthica.*

Acmaeodera labyrinthica Fall

Many specimens of this beautiful species were collected in the Siskiyou Mountains of southern Oregon, the specimens being most numerous on the upper Applegate in the vicinity of Copper, Jackson County, near the Oregon-California line. Two specimens were dug from dead scar tissue of living Garry oaks (*Quercus garryana* Dougl.). In early June many specimens were taken feeding on the blossoms of *Eriophyllum lanataum* (Pursh) Forbes. This species is considered as distinct by some writers and as a variety of *connexa* or *acuta* by others. However, in any series it can be easily distinguished by its breadth and bronze lustre. In the last respect it more closely resembles *hepburni,* from which it differs by the shape of the pronotum and the emargination of the prosternum.

A rather interesting observation was made upon the group *acuta, connexa, hepburni* and *labyrinthica* which would seem worthy of mention. Numerous specimens of *labyrinthica* with lesser numbers of *acuta, connexa* and *hepburni* were observed on

three occasions while they were feeding on the previously mentioned yellow composites. During this time numerous pairs were seen mating, but at no time did specimens outside the species succeed in copulating, though occasional attempts were made. Although the four species are distinctive enough to be separated on external features, this bit of information lends more proof to the belief that there are four distinct species.

Acmaeodera mariposa Horn

This distinctive species is not abundant, but a couple of dozen specimens have been taken. About one-half of them have been dug from their pupal cells in mountain mahogany (*Cercocarpus betuloides* Hook.) where they work through dead trunks or through dead patches in living trees. During the spring of 1940, several specimens were swept from the foliage of antelope brush (*Purschia tridentata* [Pursh.] D. C.) on Roxy Anne Butte, five miles east of Medford, Jackson County, Oregon. All specimens have been taken on or near the floor of the Rogue River Valley, none apparently occurring above 2500 feet elevation.

Acmaeodera plagiaticauda Horn

Because this species is seldom obtained while sweeping it is considered rare. After learning the habits of the larvae, and collecting accordingly, recently transformed adults are quite easily obtained by cutting through the dead patches of manzanita (*Arctostaphylos viscida* Parry). It ranges over most of southwestern Oregon, extending as far north as Azalea, Douglas County.

Acmaeodera purschiae Fisher

This species was first found in the state near Medford, Jackson County, where two specimens were cut from antelope brush (*Purschia tridentata* Pursh.). On June 12, 1940, about thirty specimens were taken while sweeping the host plants on Roxy Anne Butte, Jackson County. Previously, five specimens had been cut from the host plant at the base of Mount Shasta, near Weed, Siskiyou County, California. The range of this species is thus extended northward by several hundred miles and into a third state.

Acmaeodera sinuata var. sexnotata Van Dyke

Numerous specimens of this beautiful variety have been collected, all having been dug or swept from buckbrush (*Ceanothus cuneatus* Nutt.). They range over most of southwestern Oregon, especially through the Siskiyou Mountains. No examples of the species *sinuata* Van Dyke have as yet been taken.

Acmaeodera vandykei Fall

This widely distributed species has seldom been found in its pupal cell. It is not common but is found throughout the portion of the state where the deer brush (*Ceanothus integerrimus* H. & A.) occurs. One specimen was also taken from sticky laurel (*Ceanothus velutinus* Dougl.), which must also be listed as a host plant. Specimens have been taken in the Wallowa and Blue Mountains of northeastern Oregon, Hood River County, and south along the eastern slope of the Cascade Range, and across into the Rogue River Valley and the adjoining foothills.

Acmaeodera varigata LeConte

This species has the widest distribution in the state. Specimens have been taken from the following Oregon counties: Douglas, Grant, Hood River, Jackson, Josephine, Klamath, Lake and Wheeler. The specimens have been cut from two species of mountain mahogany (*Cerococarpus betuloides* Hook. and *C. ledifolius* Nutt.) and from service berry (*Amalanchier* sp.) and are generally found above 3000 feet in elevation. Two variations are noticeable, the specimens cut from service berry are smaller and the specimens taken near Glendale, Douglas County, are more abundantly maculate.

I am indebted to Mr. James H. Baker of Baker, Oregon, for permission to include a series of fourteen specimens of *A. variegata* Lec. from his collection. Nine of these were taken near Baker, Baker County, the other five were collected at Hiatt Lake, Jackson County. His series, which is typical, thus extends the species into the northeastern corner of the state.

A NEW DOBSONFLY (MEGALOPTERA) FROM CALIFORNIA

BY EDWIN C. VAN DYKE
California Academy of Sciences, San Francisco, California

In 1908, Banks published a paper on the classification of the Corydalinae, in which he defined the various genera of the group, at the same time establishing two new genera at the expense of older genera. One of these was *Neohermes* which was to include the following previously described species: *filicornis*[1] Banks, the genotype, *californicus* Walker, *angusticollis* Hagen, *cinerascens* Blanchard, and *humeralis* Banks.

The genus *Neohermes* is defined by Banks as having the anal vein of forewings with two forks, the anal cells subequal in length, the lower with two veins, the upper with one, and no cross vein between the first branch of the anal vein and the vein from anal cell, the costal cells about as long as broad, the antennae as near to the ocelli as to the eyes, the branches of the median vein simple, and but three cross veins from radial sector to radius.

Neohermes nigrinus Van Dyke, new species

Of moderate size and entirely black except the anterior part of head which is somewhat fulvous and a few cross veins on the outer portion of both wings which are white. Head widest across eyes which are of moderate size and protuberant, convergent in front and gradually narrowed behind, the ocelli conspicuous, and with two elongate callosities centrally located behind; antennae filiform, with segments slightly longer than broad and somewhat moniliform, and almost three-fourths length of forewing. Prothorax longer than broad, with sides parallel and disk opaque except for sides and medial area behind, which are smooth and shining. Wings about four times as long as broad, the hind pair with sides more parallel as usual. The wing venation agrees with the genus and such typical species as *californicus* Walker.

Holotype (No. 5430, Mus. Calif. Acad. Sci., Ent.) and one paratype. Holotype, expanse of wings, spread, 5 cm. 2 mm., length of body 2 cm.; paratype, expanse of wings 4 cm. 2 mm., length of body 1 cm. 5 mm. Both specimens were collected by me at RICHARDSON'S SPRING, BUTTE COUNTY, CALIFORNIA, the holotype, May 12, 1944, and the paratype May 18, 1944.

The black color, moderate size, a rather small head as compared with *californicus*, and simple filiform antennae should readily separate this species from any of the others in the genus.

[1] According to Weele, Coll. Zool., Selys Longchamps, 1910, *filicornis* Banks as also *angusticollis* Hagen, *concolor* Davis, and *minutus* Davis are synonyms of *californicus* Walker, therefore the last would be the genotype.

FURTHER NOTES ON THE HABITS OF SOME FLAT BUGS WITH A DESCRIPTION OF THE MALE OF ARADUS PATIBULUS VAN DUZEE

(Hemiptera, Aradidae)

BY E. G. LINSLEY AND R. L. USINGER
University of California

The following observations on aradids were made between May 10th and June 15th, 1942, in the Sierra Nevada Mountains of Madera and Mariposa counties in the vicinity of the south entrance of Yosemite National Park, California. As in our previous paper,[1] biological observations are by E. G. Linsley, taxonomic notes and identifications by R. L. Usinger.

Aradid spring dispersal flights were observed at Miami Ranger Station, Madera County. The flights began on May 19th, which was the third of three successively warmer days after the end of the spring snow storms and rains. On May 19th, the flight began at approximately 5 P.M. P.S.T. and was over by 6:15 P.M. A sample of 102 specimens was taken. This included 6 species, of which 51 per cent of the examples were *Aradus behrensi* Bergr. On May 20th a second flight occurred. The day was warm but overcast in the late afternoon. The flight began at approximately 4 P.M., was over by 5:30 when the temperature began to fall. The same sampling method yielded only 39 examples of two species, with *A. behrensi* again predominant. On May 21st, a third flight occurred, this time on a warm but wholly overcast day. The flight began at about 4 p.m., lasted until approximately 6:00. Forty-three examples were taken representing six species, of which more than 50 per cent were again *behrensi*. On this date three species appeared which had not been represented in previous samples. This was the last flight observed. On both May 22nd, and 23rd, one example of *behrensi* was taken but no further examples were captured in flight between May 23rd and June 15th (termination of observation).

Associated with the aradids in their dispersal flights were numerous species of Coleoptera (fig. 1). Although the samples

[1] Linsley, E. G. and R. L. Usinger, 1942. Notes on some flat bugs from the vicinity of Mt. Lassen, California. Pan-Pac. Ent., 18:83-86.

obtained are too small to be of significance as far as most of the individual species are concerned, the totals clearly indicate that the flights of these insects as a group were correlated with those of the aradids. Of further significance would appear to be the fact that the majority of these species are bark inhabitants, as are aradids, the remainder mostly wood borers. This suggests that the same factors which initiate aradid dispersal also influence emergence of other insects which occupy the same habitat.

ARADINAE

Aradus ampliatus Uhler

This species was not encountered until the third day of dispersal flights. This is of interest in view of the fact that in the Mt. Lassen area adults were taken in flight two days prior to the flights of other species.

Aradus patibulus Van Duzee

Taken in flight only on May 19th. Adults later found under bark of western yellow pine at Fish Camp, Mariposa County. Not previously observed in dispersal flight.

Male. Antennae and pronotum as in the female (Usinger, Ann. Ent. Soc. Amer., 29:515, plate I, fig. 4A, 1936) but size smaller, 7 mm. long, 2½ mm. wide across pronotum, and 3½ mm. wide across the abdomen. Male genital capsule similar to that of *ampliatus* Uhler (Usinger, *Loc. cit.*, fig. 4) but narrower than long, 27::29; more narowed basally with shallower, rounded basal sinuation; and apical lobes a little more strongly produced, extending beyond general contour of abdomen. Other characters as in the female.

Neallotype, male, Miami Ranger Station, Mariposa County, California, May 20, 1942 (E. G. Linsley).

Aradus depictus Van Duzee

In flight on May 21st. This species was not encountered in the Mt. Lassen area.

Aradus fuscomaculatus Stål

In flight only on May 19th. Also found under bark of western yellow pine at Sugar Pine, Madera County. Not previously observed in dispersal flight.

Aradus behrensi Bergroth

This species dominated the dispersal flights on May 19-21, but was most numerous (52 examples) on May 19th. On May 30th. at Bass Lake, Madera County, 67 adult specimens were found under a six-inch square of bark of *Quercus kelloggii*,

Table I

COLEOPTERA ASSOCIATED IN ARADID DISPERSAL FLIGHTS - MIAMI RANGER STATION - MAY 1942

	May 18	May 19	May 20	May 21	May 22	May 23
Latrimaeum pictum Fauv. (Staphylinidae)	0	12	2	0	0	0
Alonothroscus validus Lec. (Throscidae)	0	14	1	2	0	0
Throscus mendax Horn (Throscidae)	0	6	0	2	0	1
Eronyxa expansa Van Dyke (Ostomidae)	0	3	0	0	0	0
Calitys scabra Thunberg (Ostomidae)	0	2	1	0	0	0
Tenebroides sinuatus LeConte (Ostomidae)	0	1	3	2	0	0
Lobiopa oblonga Parsons (Nitidulidae)	0	1	1	4	0	1
Perthalycra murrayi Horn (Nitidulidae)	0	3	5	0	0	0
Clischrochilus cylindricus (LeConte)(Nitidulidae)	0	1	2	0	0	0
Lasmophloeus sp. (Cucujidae)	0	6	19	7	0	0
Lasmophloeus sp. (Cucujidae)	0	1	5	3	0	0
Cryptophagus sp. (Cryptophagidae)	0	3	2	0	0	0
Mycetophagus californicus Horn (Mycetophagidae)	0	11	2	0	1	0
Lasconotus complex LeConte (Colydiidae)	0	0	9	0	0	0
Aulonium longum LeConte (Colydiidae)	0	0	3	1	0	0
Phymaphora californica Horn (Mycetaeidae)	1	8	5	5	0	0
Ptinus interruptus LeConte (Ptinidae)	0	2	0	2	0	0
Ernobius punctulatus (LeConte) (Anobiidae)	0	2	10	4	0	0
Stephanopachys pacificus Casey (Bostrichidae)	0	7	6	3	0	0
Spondylis upiformis Mannerheim (Cerambycidae)	2	6	11	3	1	1
Asemum mokelumne (Casey) (Cerambycidae)	0	3	1	0	0	0
Atimia dorsalis LeConte (Cerambycidae)	0	4	14	9	0	0
Gylptoscelis sequoiae Blaisdell (Chrysomelidae)	0	2	11	0	1	0
Rhinomacer bombifrons LeConte (Curculionidae)	0	1	3	0	0	0
Pissodes yosemite Hopkins (Curculionidae)	0	2	6	3	0	1
Cossonus ponderosae Van Dyke (Curculionidae)	0	8	11	5	1	0
Cossonus crenatus Horn (Curculionidae)	0	4	7	0	2	0
Dendroctonus valens LeConte (Scolytidae)	2	58	53	16	2	0
Hylurgops leconteï Swaine (Scolytidae)	0	9	12	2	0	2
Hylastes nigrinus (Mannerheim) (Scolytidae)	0	19	34	4	1	2
Hylastes macer LeConte (Scolytidae)	14	148	113	78	14	6
Pityophthorus sp. (Scolytidae)	0	6	2	0	1	0
Ips latidens (LeConte) (Scolytidae)	0	2	4	3	0	0
Gnathotrichus sulcatus (LeConte) (Scolytidae)	0	3	17	2	0	0
TOTAL	19	415	375	160	24	14

where they had apparently congregated for mating. No immature stages were present.

Aradus apicalis Van Duzee

In flight only on May 21st. Dispersal flights of this species have not been previously recorded.

Aradus debilis Uhler

Small flight on May 19th. This species overwinters as adults or last instar nymphs. First instar nymphs were found on *Polyporus volvatus* fungi on fallen western yellow pine on May 28th, 9 days after the dispersal flight was observed. Adults were also found in large numbers on the dark upper surface of the fungus, *Fomes penicola*, on fallen white fir at Mariposa Big Trees, June 6th. Because of perfect cryptic coloration they were very difficult to detect and several minutes were required to complete examination of each fungus. The maximum number of individuals encountered on a single fungus was fourteen.

Aradus blaisdelli Van Duzee

In flight on May 19th. Dispersal flight not previously recorded. Adults also found under bark of western yellow pine.

Aradus compressus Heidemann

In flight on May 19th, 20th, and 21st. Largest flight on May 19th.

Aradus cinnamomeus Panzer

Commonly beaten from branches and new foliage of western yellow pine at Miami Ranger Station and Fish Camp, Mariposa County, from May 19th to June 10th. A few examples were also found on *Abies concolor* at Sugar Pine, Madera County.

MEZIRINAE

Mezira reducta Van Duzee

Found at Miami Ranger Station in colonies of *Zootermopsis* in western yellow pine, sugar pine, white fir, and red fir, and in nests of *Xylocopa californica* in incense cedar.

Mezira pacifica Usinger

Taken under bark western yellow pine, sugar pine, Digger pine, white fir, incense cedar, *Quercus kelloggii*, *Alnus rhombifolia*, and *Populus trichocarpa*.

NOTES ON THREE SPECIES OF THE GENUS COENONYCHA HORN

(Coleoptera, Scarabaeidae)

BY J. W. TILDEN AND G. S. MANSFIELD

In view of the somewhat limited information available on species of the genus *Coenonycha* Horn, it was thought the following notes concerning three recently described species might prove of interest.

The type series of *C. bowlesi* Cazier was collected about three miles northeast of Benton, Mono County, California, by J. W. Tilden and C. W. Bowles. The first specimens taken were attracted to a gas lantern at dusk. The remainder were collected from the tips of *Artemisia tridentata,* one person collecting while the other held the light. Most of them had the forelegs extended, a habit common to species of this genus. They seemed indifferent to light that was held on them, though some were attracted to the light if it remained stationary for a period of time. The vegetation of this area is predominantly *Artemisia tridentata,* with an admixture of other bushy composites. *C. bowlesi* may occur on other plants. although to date it has not been taken elsewhere.

C. testacea Cazier, described from Cuyama Canyon, Santa Barbara County, California, was taken in large numbers about ten miles west of Simmler, San Luis Obispo County, by the authors on March 20-22, 1940. This species was closely associated with *Eriogonum fasiculatum* here as in the type locality. On each of the three evenings in the Simmler area the first specimens noted came to a gas lantern shortly after sundown. Mating pairs were observed about dark and commonly later in the evening.

The insects were taken in numbers from the tips of the plants, and normally sat with the forelegs extended as in *bowlesi.* They have well developed flight wings but seem averse to flying. The number taken at light was very small in proportion to the population that was found to exist in the immediate area. The few that came to light must have flown there, since the collecting sheet was clear of the ground. Specimens were taken from the plants until about 12:00 P. M. No doubt they could have been taken later, although we found the insects less numerous in the late hours than they were earlier in the evening.

A third species, *C. ampla* Cazier, was also found near Simmler, but on *Juniperus californica,* the only tree in the vicinity. The first was taken by beating about 10:00 P. M., March 21. Extensive beating and inspection yielded several others on the same night.

On the succeeding night, these were observed carefully. At first we thought them rare, since so few were found, but one location was discovered where about 18 were taken. Though relatively common, they did not approach *testacea* in numbers, in this area at least.

Careful approach enabled us to observe these insects without disturbing them. Each was found at or near the tip of a twig. This species proved to be negatively phototropic. They would nearly always drop at the close approach of the light, or would edge around to the other side of the twig. They were seen to extend their forelegs as did the other two species. It was noted also that they dropped if our breath was blown on them. Whether this was due to objection to the air current or to another factor we do not know.

At first no feeding was observed. It occurred to us that this might be due to the light. Such proved to be the case. When the light was weakened, the beetles became active and fed. When in moderate to strong light they suspended activity. One of us obsrved while the other slowly removed the light. The beetle was seen to crawl deliberately along the limb and begin to feed. With a slow return of the light, the beetle first ceased to feed, then stopped all movement, and as the light grew stronger, extended its legs and dropped to the foliage beneath. It made no effort to extricate itself from the position in which it landed as long as the light was present. With the removal of the light, activity was resumed gradually. Several were observed to behave in this same manner, and although the quiescent individuals were conspicuous at all times, they made no effort at concealment.

This habit might easily lead to their dropping before being taken by beating, and it seems likely that the species is more common than our collecting results show.

All three were found at the tips of their respective forage plants with forelegs extended, but in the case of *ampla* this appeared to be the first stage in a negative response to light, for with an increase in the intensity of the light they extended the other pairs of legs as well, and dropped from the trees.

None of these species was found in daytime, all activities of mating and feeding being strictly nocturnal, nor were any taken on any plant other than the one listed for each species.

BREEDING OF *PHOEBIS SENNAE MARCELLINA* CRAM. IN SAN JOSE, CALIFORNIA

(Lepidoptera, Pieridae)

In October, 1941, Piazza first noted larvae of this species on cultivated shrubs of *Cassia tomentosa*, and later located pupae and eggs. Reared specimens emerged continuously during the fall. Piazza and Tilden took a considerable number of all stages from a shrub of the same species, on December 2, 1941, and these were reared by Tilden.

From 17 chrysalids removed from the shrub and kept indoors, 2 perfect males, 4 perfect females emerged, while 6 females emerged with damage from defective chrysalids. Two chrysalids were parasitized. Three failed to produce adults. Emergence dates range from December 4 to January 9 (1942). The proportion of females seems unusual, there being 8 females and 4 males, a ratio of 2:1. Adults reared from specimens collected as larvae emerged in better condition than those obtained from specimens that had pupated before being taken, suggesting probable damage to the chrysalids in removing them from the food plant.

Emerged specimens refused to mate in captivity. Eggs taken on December 2 did not hatch before the project was abandoned in June, 1942. All specimens taken as larvae matured and pupated; some still had not emerged in June, indicating a long pupal stage under some conditions.

Although adults of *P. s. marcellina* Cram. have been noticed repeatedly in the San Jose area over a period of several years, this appears to be the first time that the entire life cycle has been observed at any locality so far north. Santa Barbara County is given by Dr. J. A. Comstock as the usual northern limit of the (breeding?) range.

It is possible that the species may be establishing itself in the San Jose area, probably due to the cultivation of suitable food plants, which enable stragglers of this strong-flying butterfly to form at least temporary colonies north of its normal range.—J. W. TILDEN.

A BRIEF NOTE ON THE HABITS OF AMOBIA (PACHYOPHTHALMUS) FLORIDENSIS TOWNSEND

(Diptera, Sarcophagidae)

BY E. GORTON LINSLEY

University of California, Berkeley

Amobia (*Pachyophthalmus*) *floridensis* Townsend appears to be a common inhabitant of the nests of *Sceliphron servillei* (Sauss.) in California. On numerous occasions the writer has found pupae of what was apparently this species in the mud cells of this wasp. In February, 1944, however, in connection with another study, large numbers of *Sceliphron* nests from various localities in the San Joaquin Valley were examined and a small percentage from each locality contained pupae of this fly. Pupae were found in sealed cells under conditions suggesting that larvae or eggs were deposited during the provisioning period. The larvae had apparently fed on the *Sceliphron* larvae as well as on the stored spiders. Seven adults reared on April 4 from a cell series taken under a culvert at Chowchilla, Madera County, on February 15, were sent to H. J. Reinhard, who identified them as *Amobia* (*Pachyophthalmus*) *floridensis* Townsend. Allen[1] summarizes the known habits of *Pachyophthalmus* as follows:

"The members of the genus, so far as known, are biologically superimposed on wasps which build mud nests under shelter or in hollow stems, including members of the families Sphecidae and Eumenidae. The manner in which the female establishes her progeny and the subsequent larval development have not been observed. Rau found the puparia of one species lodged in a hollow stem containing the nests of *Odynerus*. When associated with the common "dirt daubers" *Pelopaeus* and *Trypoxylon*, which build their nests indoors, it is not known whether the maggots pupate within the mud cells of their hosts or leave them to seek other shelter for the transitional stage. The members of the genus *Pachyophthalmus* are more distinctly aerial in habit than the other North American genera of Miltogrammini. So far as is known, all of the activities of adult, larval, and pupal stages take place in a stratum extending from a foot or more to several feet above the ground. This is a noteworthy biological specialization in a group of flies, most of which pass the immature stages underground, and never rise, as adults, but a few inches above the ground."

A. (*P.*) *floridensis* has been previously recorded from cells of *Sceliphron cementarium* (Drury) in Maryland and Mississippi.

[1] Allen, H. W., 1926. North American species of two-winged flies belonging to the tribe Miltogrammini. Proc. U. S. Nat. Mus., 68(9)1-106, pls. 1-5.

RECENT WORK BY THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

BY FRANCIS HEMMING
Secretary to the International Commisison on Zoological Nomenclature

The International Commission on Zoological Nomenclature are now engaged in the publication of decisions taken before the outbreak of war in 1939. These decisions have been embodied in *Opinions* 134-183 and *Declarations* 10-12. Of these, *Opinions* 134-155 and the three *Declarations* have already been published or are in the press. The remainder are ready for printing and will be published as soon as funds are available.

These *Opinions* are of particular interest to entomologists, since in addition to nine *Opinions* relating to the interpretation of various aspects of the International Code, no less than 38 of these *Opinions* are directly concerned with entomological subjects.

The *Opinions* relating to the interpretation of the Code are: *Opinions* 138 (meaning of phrase "definite bibliographic reference" in Article 25) *Opinion* 141 (naming of families); *Opinion* 145 (status of names first published in invalid works); *Opinion* 147 (generic names of same origin and meaning as older generic names); *Opinion* 148 (status relating to names published as emendations of, or substitutes for, older names); *Opinion* 164 (position as regards types when two or more genera are united); *Opinion* 168 (supplementing *Opinion* 65 regarding genera based upon erroneously determined species); *Opinion* 172 (status of type—designations of genera in abstracts, etc.); and *Opinion* 183 (interpretation of Article 8 relating to form in which generic names should be published).

Of the *Opinions* specially concerned with entomological subjects, six deal with the status of particular works or with the dates of such works: *Opinion* 136 (Latreille, 1810) affects all Orders of insects; *Opinion* 135 ("Erlangen List," 1801) is of special interest to hymenopterists; *Opinions* 134 (Freyer, *Neue Beiträge*), 138 Hübner, *Samml. exot. Schmett.*, 1807 and Fabricius *Mag. Insektenk.* (Illiger) 1807) and 150 (Hübner, *Verz. bek. Schmett*) are concerned with Lepidoptera and *Opinion* 152 (Meigen, 1800) with Diptera. *Opinions* 140 and 143 deal with certain family names in insects.

The remaining 30 *Opinions* deal with particular generic names in various Orders of insects. These *Opinions* either fix the types of these genera or add the names to the *Official List of Generic Names in Zoology*, or do both. Three of these *Opinions* are concerned with Orthoptera; 13 with Hymenoptera and 14 with Lepidoptera.

Each *Opinion* is published separately but *Opinions* are consecu-

tively paged to facilitate the publication of an index on the completion of the volume concerned.

The International Commission are most anxious to secure that *Opinions* are published as rapidly as possible but they are greatly hampered by lack of funds. The Commission therefore appeal to scientific institutions and individual scientific workers for donations to a special fund to be used for the issue of publications. Full particulars of this appeal are given in Part 2 of the Commission's official organ, the *Bulletin of Zoological Nomenclature*, published in 1943.

Contributions, however small, will be warmly welcomed and will be acknowledged in the *Bulletin*. Bankers' drafts, checks, and money orders should be made payable to the International Commission on Zoological Nomenclature and sent to the Commission at their publications office, 41 Queen's Gate, London, S.W.7. All orders for the Commission's publications should be sent to the same address. Inquiries relating to the work of the Commission should be addressed to me at 83 Fellows Road (Garden Flat), London, N.W.3.

CLOVER LEAF WEEVIL IN CALIFORNIA

The clover leaf weevil, *Hypera punctata* (Fab.), an introduced species, has spread over much of California and occurs on both cultivated and uncultivated areas. Although acreage of clover in this state is very limited, the spring brood is common on *Melilotus* and other wild clovers. We have records of its presence on alfalfa in only the following counties: Alameda, Butte, Merced, Sacramento, San Joaquin, Stanislaus, and Yolo. Its presence can be expected on alfalfa anywhere it is grown in northern and central California and in some parts of southern California. However, the clover leaf weevil has not caused economic damage to alfalfa in California although it has been reported as an important pest of clover and alfalfa in other sections of the United States. On only two occasions have we found it in abundance in California. Once it was found commonly on *Melilotus indica* growing along a roadside on the lower southern slope of Mt. Diablo, Contra Costa County. More recently (July, 1941) it was taken in the same area on a very small patch of dry-farmed young alfalfa. Our climatic conditions in the spring are apparently so favorable for the development of a fungus disease that destructive numbers are generally checked before serious damage occurs. Limited acreage of clover may also partially account for the fact that this insect is not an important pest in California.—RAY F. SMITH and A. E. MICHELBACHER.